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INVITED COMMENTARY

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In the accompanying paper, Saito et al describe their use of the Inoue system, a novel prosthesis with a side branch to the left subclavian artery, to achieve promising results in 17 cases of distal aortic arch repair. The Inoue system has several unusual features that lend themselves to this particular application:

- A supporting framework of nickel titanium rings confers great flexibility and is capable of sealing within a very short attachment site between the left subclavian and left carotid arteries.
- A corset of diameter-restricting ties allows final adjustments in the orientation and position of the unsheathed, but still constrained, prosthesis, as the subclavian side-branch is retrieved using a transbrachial snare and drawn all the way into the subclavian artery.
- Once deployed, the fully embedded unibody side branch has less effect on proximal aortic implantation than a conventional (external) modular attachment cuff that would have to remain within the aorta.

Their results show that the technique appears to be both safe and effective in the short-to-medium term: serious complications were rare, aneurysm dilatation was rare, and most type I endoleaks were treatable by endovascular means. Yet, it is too early to say that this approach is clearly better than the endovascular alternatives.

The attachment means is one cause for concern. Unbarbed nickel titanium rings have not generally been effective in preventing late-occurring migration and type I endoleak. An oversized ring buckles, distorts the profile of the attached graft orifice, and induces dilatation of the surrounding aorta, whereas an undersized ring exerts no outward force and produces neither seal nor resistance to migration. The stated 2% oversizing used by Inoue et al contains no margin for error. Perhaps the side branch of the Inoue device helps secure stent-graft position, but it would help more if it had the stiffness of a stent rather than the flexibility of a series of rings.

Stroke is notably absent from the current report. In previous reports, endovascular repair of the distal arch has often been complicated by embolic stroke, and multibranched versions of the current system are no exception. The current single-branched version requires less manipulation but does not altogether avoid instrumentation of the ascending aorta and arch. I suspect this system could still produce a high stroke rate in less experienced hands, which together with the high cost of customized device manufacture, would impede widespread application.

The most widely practiced alternative involves stent-graft coverage of the subclavian artery origin. Some provision for subclavian flow must be made in any patient with an internal mammary coronary graft, a dominant left vertebral artery, a high risk of paraplegia (distal thoracic aortic aneurysm or dissection), subclavian steal, or left arm claudication. I remain to be convinced that the single side-branch is superior to carotid-subclavian bypass or transposition.